1 VIDEO MODULE

1.1 Objectives

1.1.1 Understand and explain how videos are made.

1.1.2 Understand and explain the various techniques incorporated in security systems (i.e. switchers, multiplexers, time-lapse, etc.).

1.1.3 Recognize the common problems that may interfere with the recording and/or playback of videos (i.e. out-of-sync switching, interference, tracking, etc.).

1.1.4 Understand and explain video enhancement techniques (i.e. sharpening, brightness/contrast, mean, etc.).

1.1.5 Gain the capability to use the various software programs, record/playback units, and printers available for video enhancement purposes.

1.1.6 Gain the capability to make comparisons between known images of people, property, and clothing, and suspect images.

1.1.7 Gain the capability to do routine maintenance and upkeep of video hardware.

1.2 Methods of Instruction

1.2.1 Lectures

1.2.1.1 How videos are produced

1.2.1.2 Types of videos

1.2.1.3 Security system techniques

1.2.1.4 Evidence handling and note taking

1.2.1.5 Use of software programs

1.2.1.6 Comparison interpretation

1.2.1.7 Methods of output for investigators and backup purposes

1.2.2 Literature Review

1.2.2.1 Inglis, Andrew F and Luther, Arch C. Video Engineering, 3rd edition, McGraw-Hill, New York, 1999.

1.2.2.2 Davies, Adrian and Fennessy, Phil. Digital Imaging, 4th edition, Focal Press, Oxford, 2001.

1.2.2.3 Blitzer, Herbert L and Jacobia, Jack. Forensic Digital Imaging and Photography, Academic Press, San Diego, 2002.

1.2.2.4 Equipment and Software Users Manuals

1.2.2.5 Video sections of the Division of Forensic Science - Imaging/Audio Procedure Manual

1.2.3 Training Programs

1.2.3.1 Photoshop Basics -- Proficient operation of the software as it pertains to video analysis; to include use of de-interlace, filter routines, brightness/contrast, layering, and stamp tool.

1.2.3.2 SignalScape Video and Audio -- Proficient operation of the software as it pertains to video analysis.

1.2.3.3 DPS Video and Audio -- Proficient operation of the software as it pertains to video analysis; to include use of editing tools.

1.2.4 Demonstration

1.2.4.1 Basic enhancement techniques will be observed from beginning to end and notes will be taken by the trainee.

1.2.5 Laboratory Exercises

1.2.5.1 Photography lab – demonstrating focal length

1.2.5.2 Viewing of various types of damaged video tapes

1.2.5.3 Casework will be completed by trainee under supervision – content and techniques used will be dependent on the cases submitted

1.3 Evaluation

1.3.1 Written examination

1.3.1.1 Paper on how videos are made

1.3.1.2 Techniques and terms to be defined

1.3.2 Laboratory testing

- Trainee must complete at least 9 months of casework under direct supervision. This may include real and mock cases.

1.3.3 Oral exercises

- Technical review sessions

1.3.4 Courtroom exercises

- Trainee must be capable of answering questions such as would be expected in a courtroom scenario.

1.4 Examination Questions

1.4.1 Explain how videos are produced.

1.4.2 Who were the principle players in the development of the video cassette recorder? Approximately what year was this?

1.4.3 Explain the following terms/techniques:

- Field
- Frame
- Raster
- CRT
- CCD
- Switcher
- Multiplexer
- Time-lapse

- Pixel
- Resolution
- Focal Length
- Compression

1.4.4 Provide a definition of forensic video analysis.

1.4.5 Explain the difference between single frame video capture and video stream capture.

1.4.6 Explain the most common enhancement techniques:

- Deinterlace/interlace
- Brightness
- Contrast
- Sharpening
- Mean
- Equalization

1.4.7 Explain the most common limitations in video analysis

- Poor quality tape
- Out-of-sync switching
- Camera placement
- Focal length
- Quad recording (multi image per recording)

1.4.8 Explain what NTSC is.

1.4.9 Explain what a waveform monitor is.

1.4.10 Explain what a vectorscope is.

1.4.11 What is a frame grabber?

1.4.12 Name the most common video formats and explain their differences.

1.4.13 Name the three types of video signal and explain their differences.

1.4.14 Explain the most common recording/playback problems.

- Tracking
- Interference

1.4.15 Name the two types of compression methods and explain the difference between them.

► End